Claims

1. Method and procedures to optimize the welding energy input into the heating coil of a heating coil fitting, involving a welding power supply unit, which is connected via connecting leads and connecting elements to the contact elements of the heating coil fitting, and in which the effective value of the AC welding voltage with a specific fundamental frequency and the corresponding welding time are known,

   characterized in that at least one electrical parameter of the heating coil fitting will be measured, and

   that an optimal welding energy input into the heating coil fitting is regulated using at least one energy input correction parameter, which is determined using at least one measured electrical parameter for the heating coil fitting.

2. Procedure according to claim 1,

   characterized in that the welding power supply unit provides the heating coil fitting with a DC welding voltage.

3. Procedure according to claim 1,

   characterized in that the welding power supply unit provides the heating coil fitting with an AC welding voltage with a fundamental frequency outside the tolerance range, which is marked out on the heating coil fitting for the fundamental frequency of the established AC welding voltage.

4. Procedure according to one of claims 1 through 3,

   characterized in that the energy input correction factor includes at least one inductance correction factor, which basically takes into account the influence of the heating coil inductance on the welding energy input into the heating coil fitting due to a deviation from the tolerance range for the fundamental frequency of the DC welding voltage as marked out for the heating coil fitting.

5. Procedure according to one of the claims 1 through 4,

characterized in that the energy input correction factor includes at least one correction factor for harmonic waves, which in principle takes into account the change in welding energy input due to the harmonics of the AC welding voltage as a consequence of the deviation from the tolerance range for the fundamental frequency of the established DC welding voltage as marked out for the heating coil fitting.

6. Procedure according to one of the claims 1 through 5,

characterized in that the energy input correction factor includes at least one resistance correction factor, which basically corrects for the impact on the welding energy input due to the temperature-dependency of the ohmic resistance of the heating coil in the heating coil fitting.

7. Procedure according to one of the preceding claims,

characterized in that several electrical parameters, but at least one parameter, for the heating coil fitting are/is measured before the welding process.

8. Procedure according to one of the preceding claims,

characterized in that several electrical parameters, but at least one parameter, for the heating coil fitting are/is measured during the welding process.

9. Procedure according to claim 8,

characterized in that several electrical parameters, but at least one parameter, for the heating coil fitting are/is determined continuously or in specified regular intervals during the welding process.

10. Procedure according to one of the preceding claims,

characterized in that the inductance of the heating coil in the heating coil fitting is determined as the first electrical parameter.

11. Procedure according to one of the preceding claims,

characterized in that the ohmic resistance of the heating coil in the heating coil fitting is determined as the second parameter.

12. Procedure according to one of the preceding claims,

characterized in that by means of the energy input correction factor the established welding time is individually adjusted for each welding process.

13. Procedure according to one of the preceding claims,

characterized in that using the energy input correction factor and the established effective AC welding voltage, an effective AC welding voltage with a different fundamental frequency from the established AC welding voltage or a DC welding voltage is adjusted individually for each welding process.

14. Procedure according to one of the preceding claims,

characterized in that the fundamental frequency of the AC welding voltage as established and marked out for the heating coil fitting has a tolerance range between about 25 Hz and 75 Hz.

15. Procedure according to one of the claims 10 through 14,

characterized in that the inductance of the heating coil is determined using the phase angle between current and voltage of an AC voltage measurement signal, which is placed on the heating coil fitting.

16. Procedure according to one of claims 10 through 14,

characterized in that the inductance is determined using the change in the resonance frequency of a measurement resonant circuit, to which the heating coil of the heating coil fitting is connected.

17. Procedure according to one of the claims 10 through 14,

characterized in that the inductance is determined using the difference between complex resistance measurements for the heating coil in the heating coil fitting for at least two measurement signals with different frequencies.

18. Procedure according to one of the preceding claims,

characterized in that the each electrical parameter is determined using separate measurement lines, which can be connected to the heating coil fitting.

19. Procedure according to one of the preceding claims,

characterized in that the electrical parameters are determined via the connecting lines of the welding power supply unit at the contact elements of the heating coil fitting.

20. A heating coil welding device, in particular for the procedure according to one of claims 1 through 19, with at least one welding power supply unit, with at least two connecting lines that are connected to the welding power supply unit; the connecting lines each having one connecting element, being detachably connected via the welding power supply unit to the contact elements of at least one turn of a heating coil in a heating coil fitting; and for which the welding power supply unit provides a mechanism to enter welding parameters and has at least one central control component,

characterized in that there is at least one central control component, which is connected to at least one device for the determination of at least one electrical parameter for the heating coil in the heating coil fitting; and that – when there is a deviation from the effective AC welding voltage with a specific fundamental frequency as established and marked out for the heating coil fitting - the central control unit is designed to adjust at least one or several parameters via the energy input correction factor, and to regulate the welding energy input into the heating coil fitting.

21. Heating coil welding device according to claim 20,

characterized in that the inductance of the heating coil in the heating coil fitting is the first electrical parameter.

22. Heating coil welding device according to claim 20 or 21,

characterized in that the ohmic resistance of the heating coil in the heating coil fitting is the second electrical parameter.

23. Heating coil welding device according to one of the claims 20 through 22,

characterized in that among the welding parameters to be adjusted at least one is the effective value for an AC welding voltage, a DC voltage or the welding time.

24. Heating coil welding device according to one of the claims 20 through 23,

characterized in that the established welding parameters can be obtained from a label on the heating coil fitting.

25. Heating coil welding device according to claim 24,

characterized in that the established welding parameters on the label are provided in form of a barcode, and that the data entry is done by means of a barcode reader unit, which allows it to at least read the welding parameters from the barcode into the central control component.

26. Heating coil welding device according to one of the claims 20 through 25,

characterized in that the welding voltage is a DC voltage.

27. Heating coil welding device according to one of the claims 20 through 25,

characterized in that the welding voltage is an AC voltage with a fundamental frequency, which deviates from the established fundamental frequency of the AC welding voltage for the heating coil fitting.